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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/812,485	03/19/2001	Yoshinari Kumagai	BEAR006CIP	1637

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EXAMINER	
KAM, CHIH MIN	

ART UNIT	PAPER NUMBER
1653	

DATE MAILED: 02/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/812,485	KUMAGAI ET AL.	
	Examiner	Art Unit	
	Chih-Min Kam	1653	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) *3-5,12 and 13* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,6-11,14 and 15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Status of the Claims

1. Claims 1-15 are pending.

Applicants' amendment filed November 5, 2003 is acknowledged, and applicant' response has been fully considered. Claim 1 has been amended, and new claims 14 and 15 have been added. Claims 3-5, 12 and 13 are non-elected invention, thus withdrawn from consideration. Therefore, claims 1, 2, 6-11, 14 and 15 are examined.

Oath/Declaration

2. A Substituted Declaration submitted November 5, 2003 is acknowledged.

Objection Withdrawn

3. The previous objection of claims 3-5 is withdrawn in view of applicants' response at page 4 in the amendment filed November 5, 2003.

Rejection Withdrawn

Claim Rejections - 35 USC § 102

4. The previous rejection of claims 1, 2, 7 and 8 under 35 U.S.C.102(b) as being anticipated by Cheng *et al.* (U. S. Patent 5,849,865), is withdrawn in view of applicants' amendment to the claim and applicants' response at page 5 in the amendment filed November 5, 2003.

Claim Rejections-Obviousness Type Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 1-2, 6-11, 14 and 15 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-5, 7-9 and 12-24 of copending application 09/641,034. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1-2, 6-11, 14 and 15 in the instant application disclose a linear peptide compound about 10 to about 50 amino acids in length, wherein the peptide compound enhances bone growth, and wherein each amino acid is D- or L-conformation, and the sequence comprises an integrin binding motif; and a formulation comprising the peptide compound and a carrier. This is obvious in view of claims 1-5, 7-9 and 12-24 of copending application which disclose a peptide compound consisting of about 10 to about 50 amino acids in length, wherein the peptide comprises an integrin binding motif and has a biological activity of enhancing bone growth, and wherein each amino acid is D- or L-conformation; and a formulation comprising the peptide compound and a carrier. Since the claims of the instant application and those of the copending application are directed to a linear peptide compound having the biological activity of enhancing bone growth and consisting of about 10 to about 50 amino acids in length, wherein each amino acid is D- or L-conformation, and the sequence comprises an integrin binding motif. Thus, claims 1-2, 6-11, 14 and 15 in present application, and claims 1-5, 7-9 and 12-24 of copending application are obvious variations of a peptide compound enhancing bone growth and consisting of about 10 to about 50

amino acids in length, wherein each amino acid is D- or L-conformation, and the sequence comprises an integrin binding motif.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

In response, applicants indicate they will provide a terminal disclaimer when application 09/641,034 is issued as a patent. Thus, the instant application remains rejected under the judicially created doctrine of obviousness-type double patenting.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1, 2 and 6-11 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a linear peptide compound of about 10 to about 50 amino acids in length with a defined amino acid sequence such as SEQ ID NOs:45, 46, 47 and 49, wherein the peptide compound enhances bone growth and comprises an RGD domain; a multimer of the peptide; and a formulation comprising the peptide and a carrier; and an identified fragment of phosphatonin polypeptide as shown in the prior art, does not reasonably provide enablement for a linear peptide compound about 10 to about 50 amino acids in length, wherein the peptide compound comprises an integrin binding motif and enhances bone growth, and wherein each amino acid is D- or L-conformation, but the sequences of the integrin binding motif and the peptide are not defined; a multimer of the peptide; and a formulation comprising the peptide and a carrier. The specification does not enable any person skilled in the art to which

it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

Claims 1, 2 and 6-11 encompass a linear peptide compound about 10 to about 50 amino acids in length, wherein the peptide compound comprises an integrin binding motif and enhances bone growth, and wherein each amino acid is D- or L-conformation (claims 1 and 2); a multimer of the peptide (claim 6); and a formulation comprising the peptide and a carrier (claims 7-11). The specification however, only discloses cursory conclusions (page 7) without data supporting the findings, which state a class of peptide compounds comprising 10-50 amino acids (D- or L-conformation), and having an integrin binding motif are useful in treating a condition associated with skeletal loss or weakness and reducing renal phosphate excretion (page 7). There are no indicia that the present application enables the full scope in view of a linear peptide compound of about 10 to about 50 amino acids in length containing an integrin binding motif and having enhancing effect in bone growth as discussed in the stated rejection. The present application provides no indicia and no teaching/guidance as to how the full scope of the claim is enabled. The factors considered in determining whether undue experimentation is required, are summarized in In re Wands (858 F2d at 731,737, 8 USPQ2d at 1400,1404 (Fed. Cir.1988)). The factors most relevant to this rejection are the breadth of the claims, the absence or presence of working examples, the state of the prior art and relative skill of those in the art, the unpredictability of the art, the nature of the art, the amount of direction or guidance presented, and the amount of experimentation necessary.

(1). The breadth of the claims:

The breadth of the claim is broad and encompasses unspecified variants regarding the sequence of the linear peptide containing an integrin binding motif, and the effect of the peptide, which is not adequately described or demonstrated in the specification.

(2). The absence or presence of working examples:

The specification indicates four RGD-containing peptides (SEQ ID NOs:45, 46, 47 and 49) show positive results in fetal mouse calvarial assay (Example 2, Figs. 3, 4), while the two peptides without RGD do not have positive results; and the peptide of SEQ ID NO:49 shows expansion of bone area in a mouse model of studying bone formation (Example 3). However, there are no working examples indicating a peptide compound containing a different integrin binding motif other than RGD, and its enhancing effect in bone growth, nor demonstrating various peptides compounds of 10-50 amino acids containing RGD having bone growth enhancing effect.

(3). The state of the prior art and relative skill of those in the art:

The prior art (e.g., Rowe, WO 99/60017) indicates a fragment of phosphatonin polypeptide, e.g., residues 141-165 of SEQ ID NO:2, which comprises the peptide of ERGDNDISPFSGDGQ (residues 151-165), or, the residues 141-180 of SEQ ID NO:2, which comprises the peptide of TDLQERGDNDISPFSGDGQPFKD (residues 147-169). However, the general knowledge and level of the skill in the art do not supplement the omitted description, the specification needs to provide specific guidance on the identities of the linear peptides of 10-50 amino acids containing an integrin binding motif, and the effects of these peptides to be considered enabling for variants.

(4). The amount of direction or guidance presented and the quantity of experimentation necessary:

The claims are directed to a linear peptide compound about 10 to about 50 amino acids in length, wherein the peptide compound comprises an integrin binding motif and enhances bone growth, and wherein each amino acid is D- or L-conformation; a multimer of the peptide; and a formulation comprising the peptide and a carrier. The specification indicates specific peptides of matrix extracellular phosphoglycoprotein containing RGD motif (pages 12-14); four RGD-containing peptides (SEQ ID NOs:45, 46, 47 and 49) show positive results in fetal mouse calvarial assay (Example 2, Figs. 3, 4), while the two peptides without RGD do not have positive results; and the peptide of SEQ ID NO:49 shows expansion of bone area in a mouse model of studying bone formation (Example 3). However, there are no working examples indicating a peptide compound containing a different integrin binding motif other than RGD, and its enhancing effect in bone growth, nor demonstrating that various peptides compounds of 10-50 amino acids containing RGD have enhancing effect in bone growth (only 4 out of 1×10^{13} peptides being identified having enhancing effect, if assuming a peptide of 10 amino acids). Since the specification fails to provide sufficient teachings on identifying various peptides with RGD domain or other integrin binding motif having enhancing effect in bone growth, it is necessary to have additional guidance and to carry out further experimentation to assess the effect of the linear peptide of 10-50 amino acids containing an integrin-binding motif.

(5). Predictability or unpredictability of the art:

The claim encompasses a linear peptide compound about 10 to about 50 amino acids in length, wherein the peptide compound comprises an integrin binding motif and enhances bone

growth, and wherein each amino acid is D- or L-conformation, however, the identification of the peptides with an integrin binding motif and having enhancing effect in bone growth are not sufficiently described in the specification, and the invention is highly unpredictable regarding the effect of the peptide.

(6). Nature of the Invention

The scope of the claim includes a linear peptide compound about 10 to about 50 amino acids in length, wherein the peptide compound comprises an integrin binding motif and enhances bone growth, but the specification does not demonstrate how to identify various peptides having enhancing effect in bone growth. Thus, the disclosure is not enabling for the reasons discussed above.

In summary, the scope of the claim is broad, while the working example does not demonstrate the claimed variants, and the teaching in the specification is limited, therefore, it is necessary to have additional guidance and to carry out further experimentation to assess the effect of the linear peptide.

7. Claims 1, 2 and 6-11 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 1, 2 and 6-11 are directed to a linear peptide compound about 10 to about 50 amino acids in length, wherein the peptide compound enhances bone growth, and wherein each amino acid is D- or L-conformation, and the peptide comprises an integrin binding motif (claims 1 and 2); a multimer of the peptide (claim 6); and a formulation comprising the peptide and a

carrier (claims 7-11). The specification indicates that a class of peptide compounds comprising 10-50 amino acids (D- or L-conformation), and having an integrin binding motif such as RGD are useful in treating a condition associated with skeletal loss or weakness and reducing renal phosphate excretion (page 7); the preferable sequences of the peptides are the sequence contiguous with the RGD sequence in the naturally occurring protein, e.g., RGD-containing peptides from matrix extracellular phophoglycoprotein (pages 12-14); and four RGD-containing peptides (SEQ ID NOs:45, 46, 47 and 49) show positive results in fetal mouse calvarial assay (Example 2, Figs. 3, 4), while the two peptides without RGD do not have positive results, and the peptide of SEQ ID NO:49 shows expansion of bone area in a mouse model of studying bone formation (Example 3). However, the specification does not describe any peptide compound containing a different integrin-binding motif other than RGD, nor demonstrates its enhancing effect in bone growth. Furthermore, the specification has not demonstrated various peptides compounds of 10-50 amino acids containing RGD have bone growth enhancing effect. There is no disclosure indicating all the linear peptides of 10-50 amino acids having RGD motif would have bone growth enhancing effect, and how to identify a functional linear peptide. Without guidance for structure to function/activity, one skilled in the art would not know which region or residue(s) of linear peptides containing RGD is essential for function/activity and how to identify a functional linear peptide. The lack of a structure to function/activity relationship and the lack of representative species for the linear peptides of 10-50 amino acids containing RGD motif as encompassed by the claims, applicants have failed to sufficiently describe the claimed invention, in such full, clear, concise terms that a skilled artisan would not recognize applicants were in possession of the claimed invention.

Claim Rejections - 35 USC § 102/103(a)

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1, 2, 7, 8 and 14-15 are rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Rowe (WO 99/60017 November 25, 1999).

Rowe teaches a phosphatonin polypeptide (SEQ ID NO:2), which comprises a RGD domain, is involved in the regulation of phosphate metabolism and bone mineralization (page 1,

paragraph 1; page 18, last paragraph; page 43, lines 1-3), and the polypeptide can be used to improve the impaired bone formation (page 49, paragraph 2); and a fragment of phosphatonin polypeptide, e.g., from about residue 141 to 160 or 161-180 of SEQ ID NO:2, may be "free-standing" or comprised within a larger polypeptide, and the fragment can be about 20, 30, 40 or 40 amino acids in length, and the term "about" includes the particularly recited ranges, larger or smaller by several (5, 4, 3, 2, or 1) amino acids at either end or both ends (the paragraph bridging page 34 to page 35), and the phosphatonin fragment can be used in treating a disease such as osteoporosis or bone mineral loss (Example 6, page 83, paragraphs 1 and 2). Thus, the fragment of phosphatonin polypeptide can be residues 141-165 of SEQ ID NO:2, which comprises the peptide of ERGDNDISPFSGDGQ (residues 151-165) and has the activity of enhancing bone growth (claims 1, 2 and 15), or in the alternative it is obvious the fragment can be residues 141-180 of SEQ ID NO:2, which comprises the peptide of TDLQ ERGDNDISPFSGDGQPFKD (residues 147-169; claim 14). The reference also teaches the preparation of a pharmaceutical composition comprising a therapeutically effective amount of the phosphatonin polypeptide or fragments thereof and a carrier such as saline, and administration of the composition to patients by parenteral injection (page 60, paragraph 3; Example 7; claims 7 and 8).

In response, applicants indicate Rowe does not disclose a peptide of 10-50 amino acids in length comprises an integrin binding motif such as RGD motif and is effective in enhancing bone growth (pages 5-6 of the response). The response has been considered, however, the argument is not found persuasive because Rowe does teach an identified fragment of phosphatonin is useful in treating a disease such as osteoporosis or bone mineral loss, e.g., residues 141-165 and 141-180 of SEQ ID NO:2 as indicated in the section above, and these peptides containing the claimed

sequence (SEQ ID NO:47 or 49) would be expected to have enhancing effect in bone growth. Therefore, the reference anticipates the claimed invention.

8. Claims 1, 2, 7, 8 and 14-15 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Rowe (U. S. Patent 6,673,900, priority date November 4, 1999).

Rowe teaches a phosphatonin polypeptide (SEQ ID NO:2), which comprises a RGD domain, is involved in the regulation of phosphate metabolism and bone mineralization (column 1, lines 11-25; column 13, lines 27-36), and the polypeptide can be used to improve the impaired bone formation (Example 6); and a fragment of phosphatonin polypeptide, e.g., from about residue 141 to 160 or 161-180 of SEQ ID NO:2, may be "free-standing" or comprised within a larger polypeptide, and the fragment can be about 20, 30, 40 or 40 amino acids in length, and the term "about" includes the particularly recited ranges, larger or smaller by several (5, 4, 3, 2, or 1) amino acids at either end or both ends (column 25, line 64-column 26, line 14), and the phosphatonin fragment can be used in treating a disease such as osteoporosis or bone mineral loss (Example 6). Thus, the fragment of phosphatonin polypeptide can be residues 141-165 of SEQ ID NO:2, which comprises the peptide of ERGDNDISPFSGDGQ (residues 151-165) and has the activity of enhancing bone growth (claims 1, 2 and 15), or, in the alternative it is obvious that the fragment can be residues 141-180 of SEQ ID NO:2, which comprises the peptide of

TDLQ ERGDNDISPFSGDGQPFKD (residues 147-169; claim 14). The reference also teaches the preparation of a pharmaceutical composition comprising a therapeutically effective amount of the phosphatonin polypeptide or fragments thereof and a carrier such as saline, and administration of the composition to patients by parenteral injection (Example 7; claims 7 and 8).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1, 2, 7-11, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reynolds (U. S. Patent 5,015,628) taken with Rowe (WO 99/60017 November 25, 1999).

Reynolds teaches phosphopeptides having 5-30 amino acids can be used for treating dental diseases, bone diseases such as osteoporosis and osteomalacia, and diseases related to malabsorption of mineral (column 1, lines 28-33), and the phosphopeptides in an effective amount can be formulated in a composition (column 8, lines 35-39) as toothpaste (Example 11;

claim 9), mouthwash (Example 17; claim 10), and topical gel (Example 23; claim 11). However, Reynolds does not disclose the composition comprises a peptide compound of 10-50 amino acids in length, which enhances bone growth and contains a integrin binding motif (RGD). Rowe teaches a fragment of phosphatonin polypeptide, e.g., residues 141-165 of SEQ ID NO:2, which comprises the peptide of ERGDNDISPFSGDGQ (residues 151-165) and has the activity of enhancing bone growth (claims 1, 2 and 15), or, the residues 141-180 of SEQ ID NO:2, which comprises the peptide of TDLQ ERGDNDISPFSGDGQPFKD (residues 147-169; claim 14); and the preparation of a pharmaceutical composition comprising a therapeutically effective amount of the phosphatonin polypeptide or fragments thereof and a carrier such as saline, and administration of the composition to patients by parenteral injection (Example 7; claims 7 and 8). At the time of invention was made, it would have been obvious to one of ordinary skill in the art to use the phosphatonin polypeptide fragment having bone growth enhancing property as taught by Rowe for preparing the composition of toothpaste, mouthwash or oral patch as taught by Reynolds because the use of phosphatonin polypeptide fragment in the composition can promote the bone growth and provide an alternative ingredient for the composition. Thus, the combined references result in the claimed invention and was, as a whole, prima facie obvious at the time the claimed invention was made.

In response, applicants indicate Reynolds does not disclose a composition comprising a peptide having an integrin binding motif, and Rowe does not disclose or suggest a peptide of 10-50 amino acids in length comprises an integrin binding motif such as RGD motif and is effective in enhancing bone growth. Accordingly, Reynolds, alone or in combination with Rowe cannot render the instant peptide compound and formulation as claimed obvious (pages 6-7 of the

response). The response has been considered, however, the argument is not found persuasive because Rowe does teach an identified fragment of phosphatonin, e.g., residues 141-165 and 141-180 of SEQ ID NO:2, is useful in treating a disease such as osteoporosis or bone mineral loss as indicated in the section above, and these peptides containing the claimed sequence (SEQ ID NO:47 or 49) would be expected to have enhancing effect in bone growth; and Reynolds disclose a composition containing a phosphopeptide for treating dental diseases, bone diseases such as osteoporosis and osteomalacia, and diseases related to malabsorption of mineral. As indicated in the section above, the combined references make the claimed peptides obvious.

Conclusion

10. No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Min Kam whose telephone number is (571) 272-0948. The examiner can normally be reached on 8.00-4:30, Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Low can be reached on (571) 272-0951. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 308-4227 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

Chih-Min Kam, Ph. D. CMK
Patent Examiner

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January 30, 2004

ROBERT A. WAX
PRIMARY EXAMINER